

CLAIMS

What is claimed is:

1           1.    A method of controlling transmitted power in a cell  
2   of a packet data mobile radio network, comprising the steps  
3   of:

4           measuring a packet data load in said cell;

5           determining a common transmitted power based on said  
6   packet data load; and

7           applying said common transmitted power to a plurality  
8   of channels in said cell.

1           2.    The method according to claim 1, wherein said  
2   plurality of channels includes substantially all channels in  
3   said cell.

1           3.    The method according to claim 1, wherein said  
2   plurality of channels includes a group of channels defined  
3   based on a quality of service requirement thereof.

1           4.    The method according to claim 1, wherein said  
2    plurality of channels includes a group of users defined based  
3    on a quality of service requirement thereof.

1           5.    The method according to claim 1, wherein said  
2    plurality of channels includes downlink channels.

1           6.    The method according to claim 1, wherein said  
2    plurality of channels includes uplink channels.

1           7.    The method according to claim 1, wherein said  
2    packet data load is weighted according to one or more  
3    predetermined criteria.

1           8.    The method according to claim 1, wherein said  
2    common transmitted power is adjusted with a predefined offset  
3    based on individual user quality of service profiles.

1           9.    The method according to claim 1, wherein said  
2    packet data load is based on channel utilization.

1           10. The method according to claim 1, wherein said  
2     packet data load is statistically derived over a predefined  
3     time period.

1           11. The method according to claim 1, wherein said  
2     packet data load is based on packet queue measurements.

1           12. The method according to claim 11, wherein said  
2     packet queue measurements include a total queue length.

1           13. The method according to claim 11, wherein said  
2     packet queue measurements include the longest queue.

1           14. The method according to claim 11, wherein said  
2     packet queue measurements include queue length changes.

1           15. The method according to claim 11, wherein said  
2     packet queue measurements include a packet length  
3     distribution.

1           16. The method according to claim 11, wherein said  
2           packet queue measurements include the longest packet.

1           17. The method according to claim 1, further comprising  
2           measuring a radio link quality for said plurality of  
3           channels, and adjusting said common transmitted power for any  
4           channel having a radio link quality measure outside a  
5           predefined quality window.

1           18. The method according to claim 17, wherein said  
2           radio link quality includes a channel data rate.

1           19. The method according to claim 17, wherein said  
2           radio link quality includes a carrier-to-interference ratio.

1           20. The method according to claim 17, wherein the  
2           quality window is defined by a lower and upper channel data  
3           rate of approximately 7-20 kbps/time slot for GMSK and  
4           approximately 14-60 kbps/time slot for 8-PSK.

1           21. The method according to claim 17, wherein the  
2           quality window is defined by a lower and upper  
3           carrier-to-interference ratio of approximately 7-25 dB for  
4           GMSK and approximately 7-35 dB for 8-PSK.

1           22. A system for controlling transmitted power in a  
2           cell of a packet data mobile radio network, comprising:  
3           a base transceiver station;  
4           a channel scheduler in said base transceiver station  
5           configured to measure a packet data load in said cell; and  
6           a power control unit connected to said channel scheduler  
7           and having a power control algorithm therein, said power  
8           control algorithm configured to determine a common  
9           transmitted power based on said packet data load, and said  
10          power control unit is configured to apply said common  
11          transmitted power to a plurality of channels in said cell.

1           23. The system according to claim 22, wherein said  
2           plurality of channels includes substantially all channels in  
3           said cell.

1           24. The system according to claim 22, wherein said  
2   plurality of channels includes a group of channels defined  
3   based on a quality of service requirement thereof.

1           25. The system according to claim 22, wherein said  
2   plurality of channels includes a group of users defined based  
3   on a quality of service requirement thereof.

1           26. The system according to claim 22, wherein said  
2   plurality of channels includes downlink channels.

1           27. The system according to claim 22, wherein said  
2   plurality of channels includes uplink channels.

1           28. The system according to claim 22, wherein said  
2   packet data load is weighted according to one or more  
3   predetermined criteria.

1           29. The system according to claim 22, wherein said  
2   power control program is further configured to adjust said

3 common transmitted power with a predefined offset based on  
4 individual user quality of service profiles.

1 30. The system according to claim 22, wherein said  
2 channel scheduler measures said packet data load based on  
3 channel utilization.

1 31. The system according to claim 22, wherein said  
2 packet data load is statistically derived over a predefined  
3 time period.

1 32. The system according to claim 22, wherein said  
2 channel scheduler measures said packet data load based on  
3 packet queue measurements.

1 33. The system according to claim 32, wherein said  
2 packet queue measurements include a total queue length.

1 34. The system according to claim 32, wherein said  
2 packet queue measurements include the longest queue.

1           35. The system according to claim 32, wherein said  
2 packet queue measurements include queue length changes.

1           36. The system according to claim 32, wherein said  
2 packet queue measurements include a packet length  
3 distribution.

1           37. The system according to claim 32, wherein said  
2 packet queue measurements include the longest packet.

1           38. The system according to claim 22, wherein said base  
2 station transceiver is configured to measure a radio link  
3 quality for said plurality of channels, and said power  
4 control algorithm is further configured to adjust said common  
5 transmitted power for any channel having a radio link quality  
6 measure outside a predefined quality window.

1           39. The system according to claim 38, wherein said  
2 radio link quality includes a channel data rate.



1           40. The system according to claim 38, wherein said  
2 radio link quality includes a carrier-to-interference ratio.

1           41. The system according to claim 38, wherein the  
2 quality window is defined by a lower and upper channel data  
3 rate of approximately 7-20 kbps/time slot for GMSK and  
4 approximately 14-60 kbps/time slot for 8-PSK.

1           42. The system according to claim 38, wherein the  
2 quality window is defined by a lower and upper  
3 carrier-to-interference ratio of approximately 7-25 dB for  
4 GMSK and approximately 7-35 dB for 8-PSK.

1           43. A method of controlling transmitted power in a cell  
2 of a packet data mobile radio network, comprising the steps  
3 of:

4           measuring a packet data load in said cell based on a  
5 predetermined one of channel utilization and packet queue  
6 measurements;

7           determining a common transmitted power based on said  
8 packet data load;

9           applying said common transmitted power to a plurality  
10   of channels in said cell;  
11           measuring a radio link quality for said plurality of  
12   channels in said cell; and  
13           adjusting said common transmitted power for any channel  
14   having a radio link quality measure outside a quality window  
15   defined based on a predetermined one of channel data rate and  
16   carrier-to-interference ratio.